

Appl. No. 10/711,178
Amdt. dated December 21, 2005
Reply to Office action of September 22, 2005

Listing of Claims:

1. (Currently amended) A method of growing a gate oxide layer, comprising:
providing a semiconductor substrate having thereon at least one silicon active area;
cleaning said silicon active area to obtain a clean silicon active area;
5 performing a preliminary anneal process, wherein said preliminary anneal process is carried out at a relatively low pressure, wherein said semiconductor substrate is placed in an airtight chamber, N₂O gas is introduced into said airtight chamber such that said silicon active area is in contact with said N₂O gas, wherein after performing said preliminary anneal process, a nitrogen oxide thin layer with limited nitrogen-silicon
10 bonds due to said relatively low pressure is formed on said silicon active area, wherein said limited nitrogen-silicon bonds prevents adverse effects on mobility of electrons in a channel region; and
after said preliminary anneal process, growing a gate oxide layer, by oxidation, on said nitrogen oxide thin layer.
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2. (Currently amended) The method of claim 1 wherein said ~~preliminary anneal process is carried out at a~~ relatively low pressure of equal to or less than 0.2 Torr.
3. (Original) The method of claim 1 wherein said preliminary anneal process is carried
20 out at a temperature of less than 1000°C.
4. (Original) The method of claim 1 wherein said N₂O gas introduced into said airtight chamber has a flow rate of about 10~8000sccm.
- 25 5. (Currently amended) The method of claim 1 wherein said preliminary anneal process is carried out at a ramp rate of 5°C/min to 100°C/min.
6. (Currently amended) A method of forming a gate oxide layer, comprising:

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providing a semiconductor substrate having thereon at least one silicon active area;
cleaning said silicon active area;

- performing a preliminary anneal process, wherein said semiconductor substrate is placed in an airtight chamber, N₂O or NO gas is introduced into said airtight chamber
5 such that said silicon active area is in contact with said N₂O or NO gas, wherein after performing said preliminary anneal process, a nitrogen oxide thin layer with limited nitrogen-silicon bonds is formed on said silicon active area, wherein said limited nitrogen-silicon bonds prevents adverse effects on mobility of electrons in a channel region; and
10 after said preliminary anneal process, growing a gate oxide layer, by oxidation, on said nitrogen oxide thin layer.

7. (Original) The method of claim 6 wherein said preliminary anneal process is carried out at a low pressure of equal to or less than 0.2 Torr.
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8. (Original) The method of claim 6 wherein said preliminary anneal process is carried out at a temperature that is less than 1000°C.
9. (Original) The method of claim 6 wherein said NO gas introduced into said airtight
20 chamber has a flow rate of about 10~8000sccm.
10. (Original) The method of claim 6 wherein said preliminary anneal process is carried out at a ramp rate of 5°C/min to 100°C/min.

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